

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A fuel cell system, comprising:

a fuel cell stack;

an oxygen concentration sensor positioned proximate the fuel cell stack;

a hydrogen concentration sensor positioned proximate the fuel cell stack;

a stack temperature sensor positioned to monitor a temperature of the fuel cell stack;

a fuel cell stack current sensor coupled to measure a current through the fuel cell stack;

a fuel cell stack voltage sensor coupled across the fuel cell stack to measure a voltage ~~current~~ across the fuel cell stack; and

a microcontroller coupled to the oxygen concentration sensor, the hydrogen concentration sensor, the stack temperature sensor, the fuel cell stack current sensor and the fuel cell stack voltage sensor to receive signals corresponding to an oxygen concentration reading of the oxygen concentration sensor, a hydrogen concentration reading of the hydrogen concentration sensor, a temperature reading to the stack temperature sensor, a current reading of the current through the fuel cell stack and a voltage reading of the voltage across the fuel cell stack, respectively, the microcontroller configured to compare the oxygen concentration reading to a oxygen concentration threshold value, the hydrogen concentration reading to a hydrogen threshold value, the temperature reading to a temperature threshold value, the stack current reading to a stack current threshold and the stack voltage reading to a stack voltage threshold on a predefined schedule during normal operation of the fuel cell system.

2. (Original) The fuel cell system of claim 1 wherein the microcontroller is configured to stop operation of the fuel stack in the case of at least one of:

the oxygen concentration reading is lower than the oxygen concentration threshold value;

the hydrogen concentration reading is greater than the hydrogen threshold value;

the temperature reading is greater than the temperature threshold value;

the stack current reading is greater than the stack current threshold; and

the stack voltage reading is greater than the stack voltage threshold.

3. (Original) The fuel cell system of claim 1, further comprising:

an air compressor positioned to pass air over the fuel cell stack, wherein the microcontroller is configured to vary a duty cycle of the air compressor in response to the stack current reading.

4. (Original) The fuel cell system of claim 1, further comprising:

an air compressor positioned to pass air over the fuel cell stack, wherein the microcontroller is configured to vary a duty cycle of the air compressor in response to the stack current reading and the hydrogen sensor is positioned downstream from the fuel cell stack with respect to the flow of air from the air compressor.

5. (Original) The fuel cell system of claim 1, further comprising:

a fuel cell voltage checking sensor coupled to a number of pairs of fuel cells to measure a voltage across each pair of fuel cells, wherein the microprocessor is further coupled to the fuel cell voltage checking sensor to receive signals corresponding a status of the fuel cells.

6. (Original) The fuel cell system of claim 1, further comprising:

a purge cell voltage checking sensor coupled to a purge cell to measure a voltage across the purge cell, wherein the microprocessor is further coupled to the purge cell voltage checking sensor to receive signals corresponding a purge cell voltage reading measured across

the purge cell, and wherein the microcontroller is further configured to compare the purge cell voltage reading to an average fuel cell voltage based on the stack voltage reading.

7. (Original) The fuel cell system of claim 1, further comprising:

an air flow sensor positioned measure an air flow over the fuel cell stack, and wherein the microcontroller is further coupled receive a signal from the air flow sensor corresponding to the measured air flow over the fuel cell stack.

8. (Original) The fuel cell system of claim 1, further comprising:

an ambient air temperature sensor positioned proximate the fuel cell stack to measure an ambient air temperature proximate the fuel cell stack, wherein the microcontroller is configured to prevent a start up of the fuel cell system and to stop operation of the fuel cell system if the ambient air temperature proximate the fuel cell stack is below an air temperature threshold.

9. (Original) The fuel cell system of claim 1, further comprising:

a fuel pressure sensor coupled to a fuel delivery system of the fuel cell system to measure fuel pressure in at least one fuel tank, wherein the microcontroller is configured to prevent a start up of the fuel cell system and to stop operation of the fuel cell system if the fuel pressure is below a fuel pressure threshold.

10. - 44. (Cancelled)